Why Has Kura Clover Failed to Persist in Northern Europe?

J. Andrzejewska[1], A. Baturo-Ciesniewska[1], D. Smith[2], C. Groves[2], K. Lackermanm[2], C. Grau[2], and K. Albrecht[2]

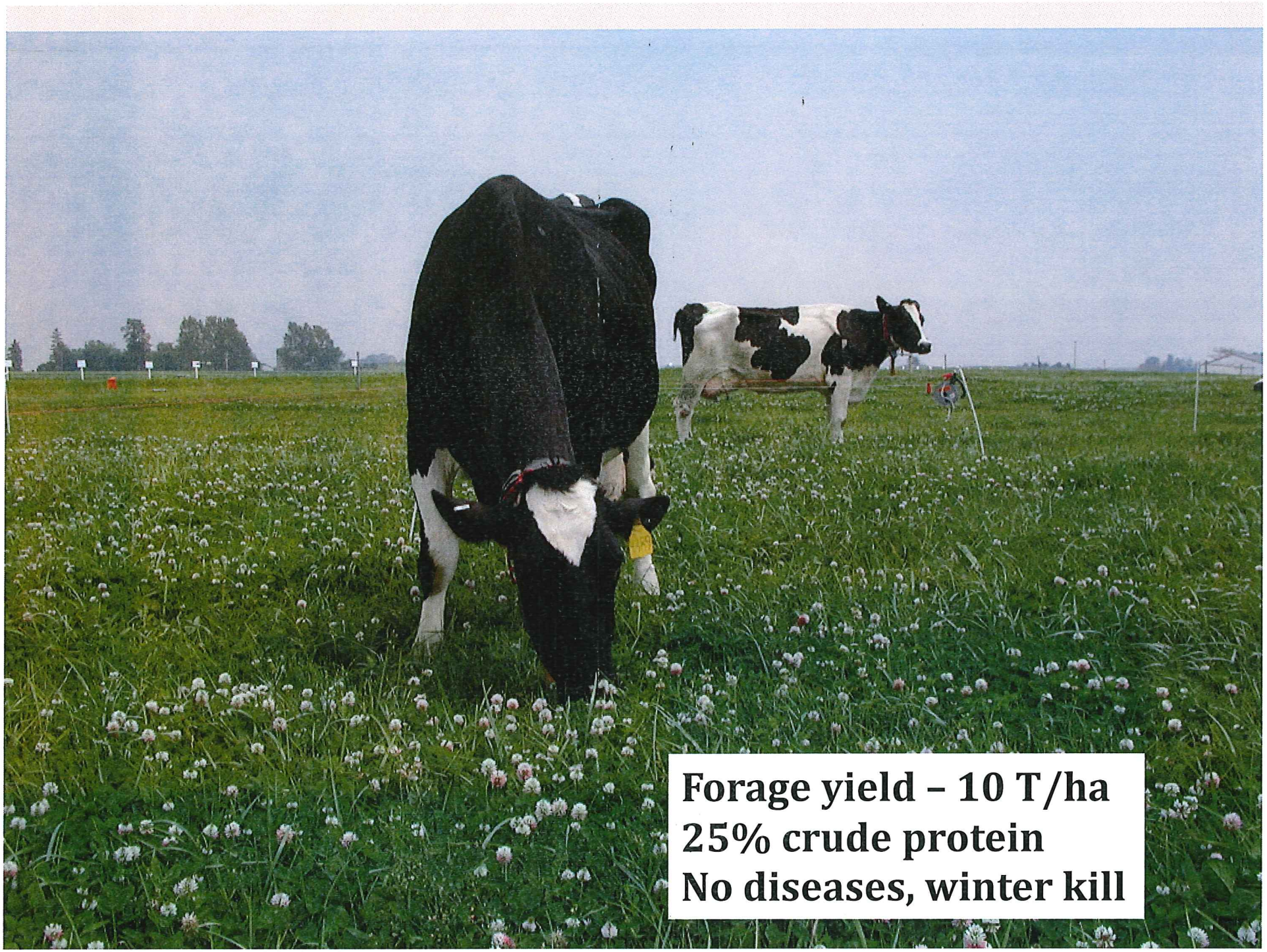
[1]University of Technology and Life Sciences, Bydgoszcz, Poland

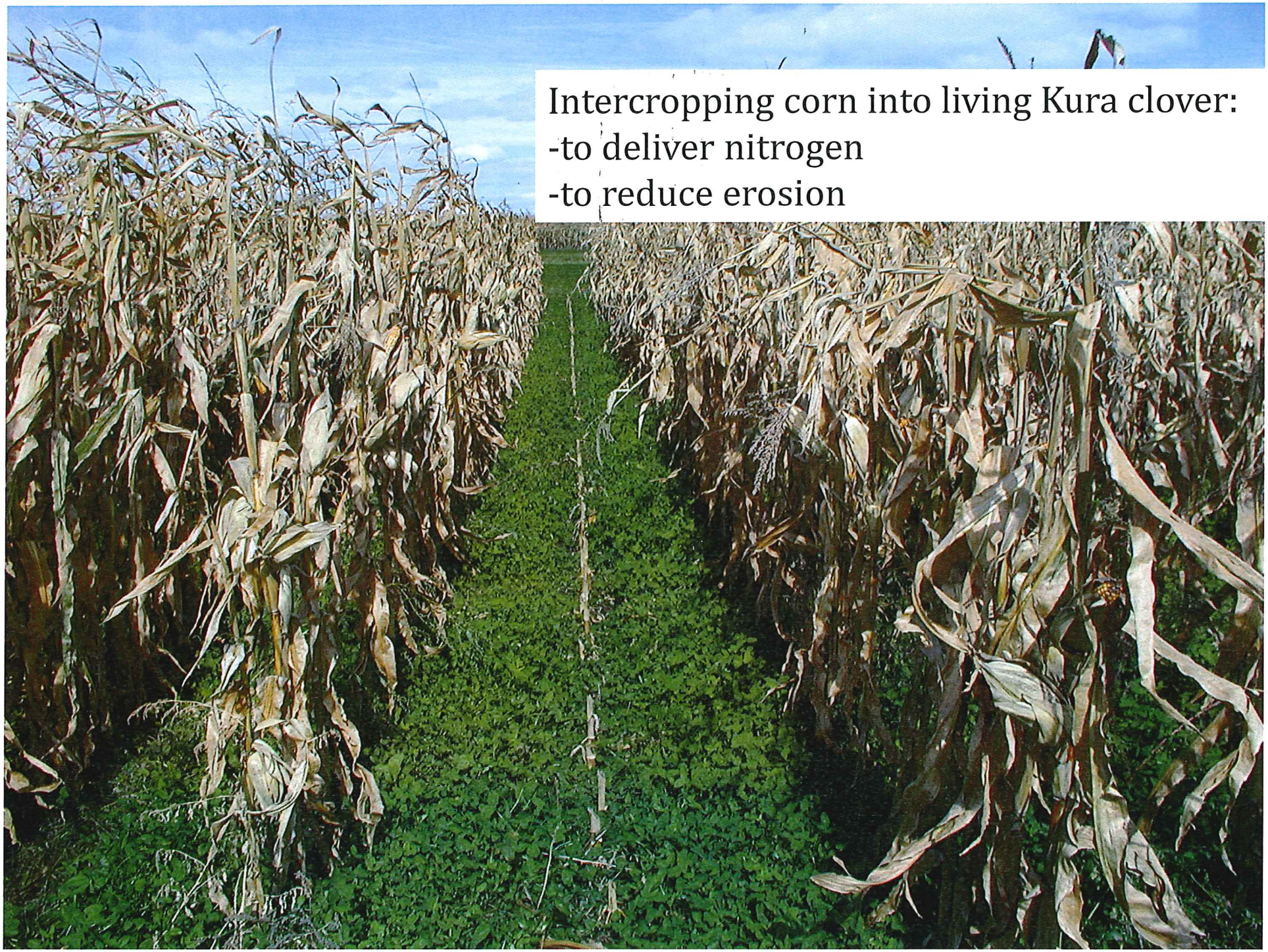
[2]University of Wisconsin-Madison, Madison, WI, USA

„If you want to be famous introduce Kura clover *(Trifolium ambiguum)* to the European agriculture!"

Prof. Walt Wedin,
University of Minnesota, 1996

Kura clover remains productive in Wisconsin pastures more than 20 years.


Forage yield – 10 T/ha
25% crude protein
No diseases, winter kill


Intercropping corn into living Kura clover:
-to deliver nitrogen
-to reduce erosion

Field experiments in Poland

- Beginning – 2009
- Breeding line – KTA 202
- Appropriate rhizobia

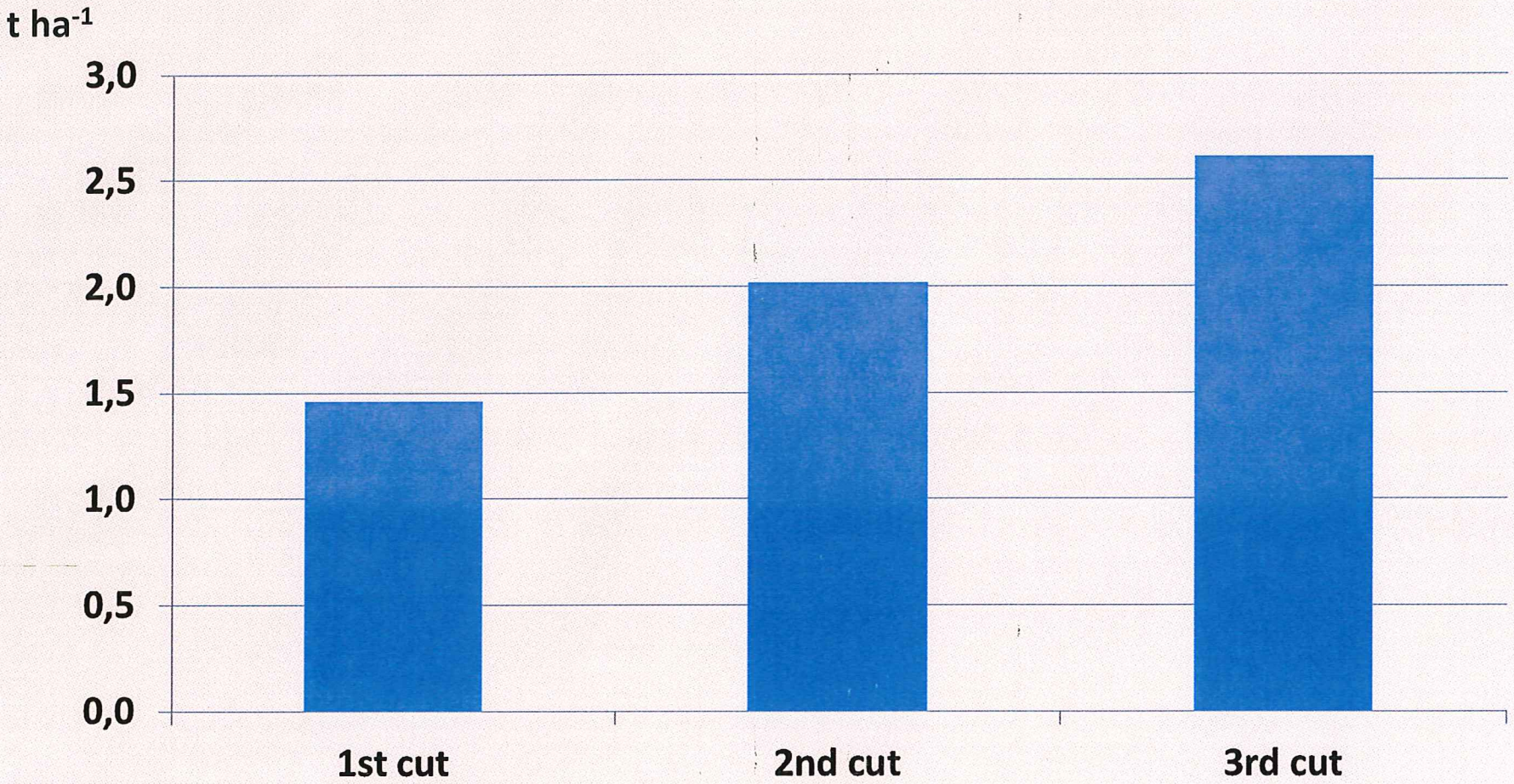

Spring, 2010
Poland


KENTUCKY SEED IMPROVEMENT ASSOCIATION

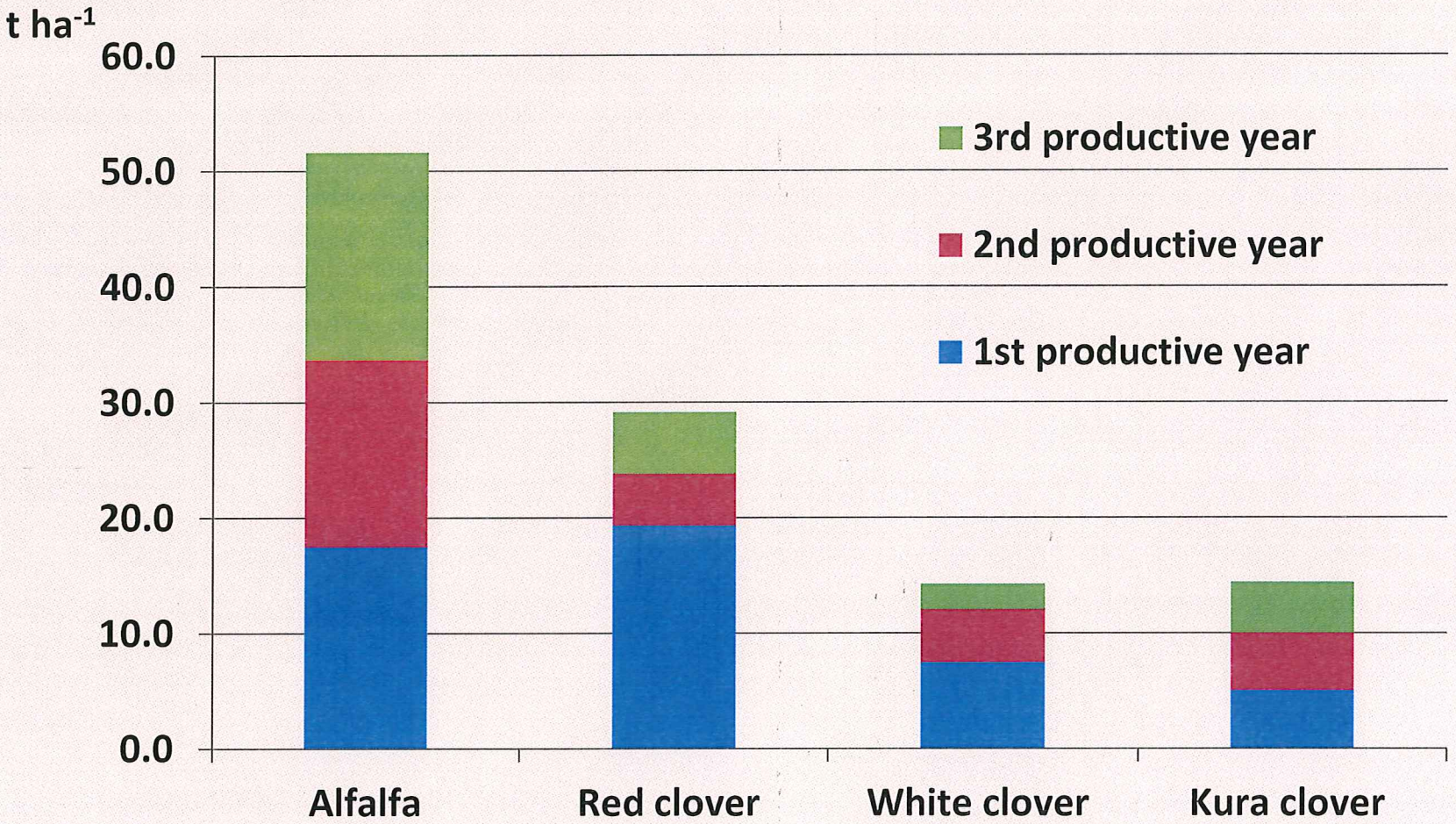
Poland
Summer, 2010


Spring, 2011
Poland

Forage yield of Kura clover (2011)



Forage yield of perennial legumes




A. - Albania
B.H. - Bośnia i Harcegowina
Ch. - Chorwacja
Cz. - Czarnogóra
L. - Luksemburg
Lich. - Lichtenstein
M. - Macedonia
S. - Słowenia
S.M. - San Marino
W. - Watykan
Islandia
Sweden
Norwegia
Findlandia
Estonia
Rosja
Łotwa
Litwa
do Rosji
Białoruś
Kazachstan
Ireland
Great Britain
Denmark
Holandia
Belgia
L.
Germany
Poland
Czech
Ukraina
Słowacja
Mołdawia
Francja
Lich.
Szwajcaria
Austria
Węgry
Rumunia
Gruzja
Azerbejdżan
Armenia
S.
Ch.
B.H.
Serbia
Monako
S.M.
Andora
Cz.
Bułgaria
Iran
Portugalia
Hiszpania
Włochy
W.
M.
A.
Turcja
Grecja
Syria
Irak
Cypr
Liban
Maroko
Algieria
Tunezja
Malta
Izrael
Jordania
Arabia Saudyjska


Spring, 2011
Poland

U1

Slide 18

U1 UTP, 6/22/2014

Laboratory experiments

Apothecia grew from sclerotia in wet sand at 12 ^{O}C after 12 weeks

More information about molecular identification of isolates on poster P6.

8 dimorphic ascospores – *Sclerotinia trifoliorum*

Sclerotinia Stem Blight
Cancer of clover

About the cover for January 2013

ISSN: 0191-2917

plant disease

Editor-in-Chief: Mark L. Gleason
Published by The American Phytopathological Society

January 2013, Volume 97, Number 1
Page 142
http://dx.doi.org/10.1094/PDIS-07-12-0624-PDN

Disease Notes

First Report of Sclerotinia Stem Blight Caused by *Sclerotinia trifoliorum* on *Trifolium ambiguum* in Poland

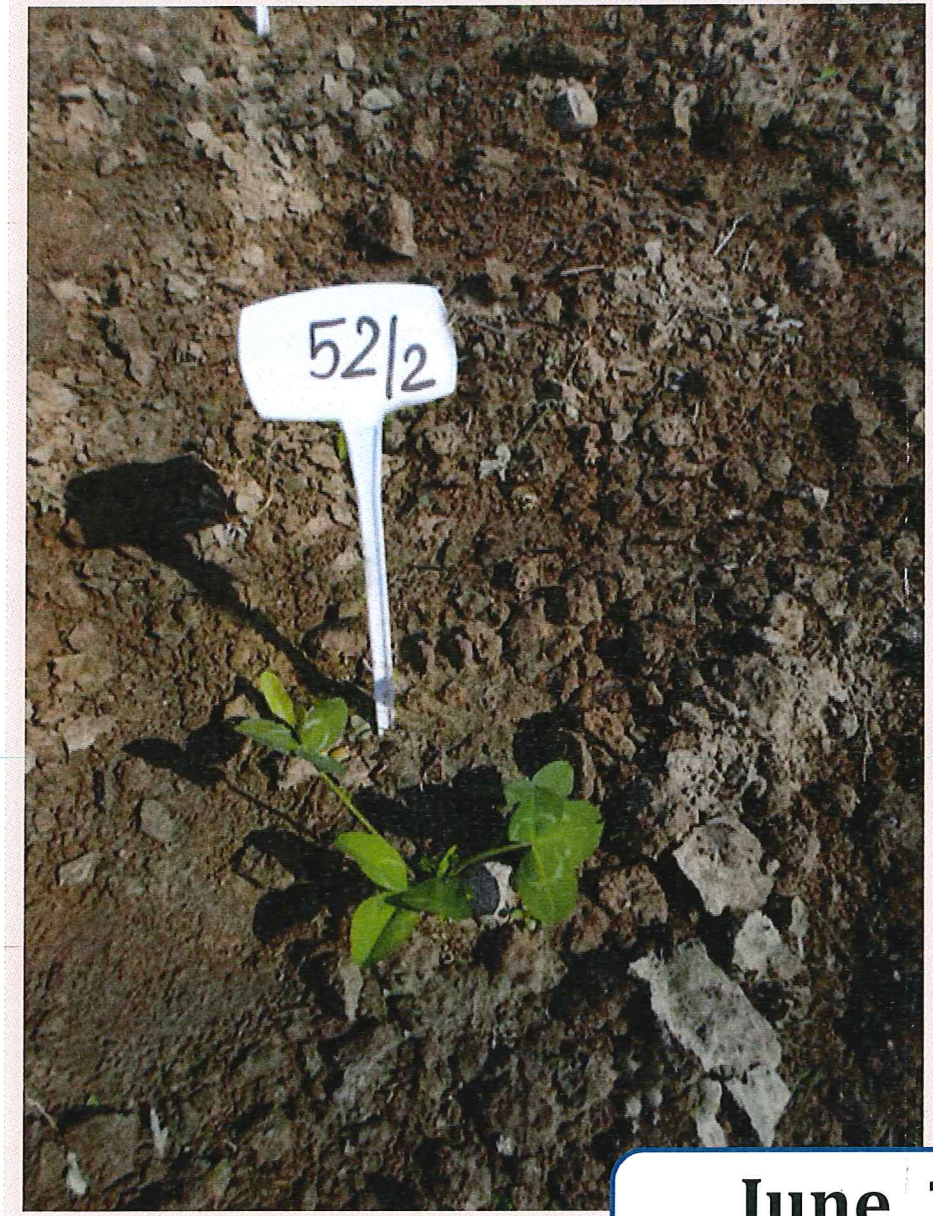
A. Baturo-Ciesniewska, Department of Phytopathology and Molecular Mycology, University of Technology and Life Sciences, Kordeckiego 20, 85-225 Bydgoszcz, Poland; **J. Andrzejewska**, Department of Plant Cultivation, University of Technology and Life Sciences, Kordeckiego 20, 85-225 Bydgoszcz, Poland; **K. A. Albrecht**, Department of Agronomy, University of Wisconsin-Madison; and **Cz. Sadowski** and **L. Lenc**, Department of Phytopathology and Molecular Mycology, University of Technology and Life Sciences, Kordeckiego 20, 85-225 Bydgoszcz, Poland.

This research was funded by the Polish Ministry of Science and Education

Selection for resistance to *Sclerotinia trifoliorum*


Summer, 2012
Poland


Summer, 2013
Poland
F30



June, 2014
Poland

Meanwhile in Wisconsin

- *Sclerotinia trifoliorum* has not been observed on Kura clover in the field.

- *S. trifoliorum* is not a serious pathogen for red clover in WI, but the disease is present.

S. trifoliorum isolates collected by Dick Smith from red clover did not infect Kura clover in the field or greenhouse

Survivors in the greenhouse for seed production

..... but we successfully infected Kura clover with the Wisconsin isolates in the GROWTH CHAMBER (15 °C)

Conclusions

- **Kura clover is very sensitive to *Sclerotinia trifoliorum* in European conditions.**

- **Kura clover can't be recommended for northern Europe until *Sclerotinia trifoliorum* resistant varieties are developed.**

This research was funded by the National Science Centre, Poland (grant NN310104839)